

**AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A method of determining impulse responses of a medium in relation to the transmission of waves between different points, method comprising:

(a) at least one step of emission in the course of which waves are emitted into the medium by generating signals  $ei(t)$  on the basis of a number  $N$  of emission points ~~belonging to included in~~ in the medium, where  $N$  is an integer at least equal to 2 and  $i$  is an index lying between 1 and  $N$  which designates one of said  $N$  emission points,

(b) at least one step of reception in the course of which signals  $rij(t)$  are picked up from said waves after transmission in said medium, at a number  $M$  of reception points ~~belonging to included in~~ in the medium, where  $M$  is a non-zero natural integer and  $j$  is an index lying between 1 and  $M$  which designates one of said  $M$  reception points,

(c) and at least one step of determination of said impulse responses  $hij(t)$  between each emission point  $i$  and each reception point  $j$  on the basis of the signals emitted  $ei(t)$  and picked up  $rij(t)$ ,

wherein during the course of step (a), said  $N$  emission points are made to simultaneously emit the signals  $ei(t)$ , these signals  $ei(t)$  having a duration  $T$  and each being a sum of  $n$  substantially monochromatic elementary signals, of like amplitude and of respective frequencies  $f_{0,i}+k \delta f$ , where  $f_{0,i}$  is a predetermined eigenfrequency at the point  $i$ ,  $k$  is an integer lying between 0 and  $n$ ,  $n$  is an integer at least equal to 2 and  $\delta f$  is a predetermined frequency interval, the respective eigenfrequencies  $f_{0,i}$  at the various points  $i$  being distinct and lying in a frequency band of width  $\delta f$ ,

and wherein during the course of step (c), each impulse response  $h_{ij}(t)$  is calculated on the basis of a signal of correlation between the signal  $e_i(t)$  emitted at the point  $i$  and the signal  $r_j(t)$  picked up at the point  $j$ .

2. (Original) The method as claimed in claim 1, in which the respective eigenfrequencies  $f_0$  at the various points  $i$  are separated pairwise by an offset  $\delta f/N$ .

3. (Previously Presented) The method as claimed in claim 1, in which, in the course of step (c), said correlation signal is windowed by means of a gate function  $\pi(t)$  of width  $1/\delta f$ .

4. (Original) The method as claimed in claim 3, in which, in the course of step (c), the impulse responses  $h_{ij}(t)$  are determined through the formula:

$$h_{ij}(t) = \Pi(t) \cdot \int e_i(\theta - t) \cdot r_j(\theta) d\theta$$

5. (Previously Presented) The method as claimed in claim 1, in which the waves transmitted in the medium between the emission points and the reception points are acoustic waves

6. (Previously Presented) The method as claimed in claim 1, in which, in the course of step (a), the medium where the waves are emitted is reverberant.

7. (Previously Presented) The method as claimed in claim 1, in which the frequency interval  $\delta f$  is less than or equal to  $1/\tau$ , where  $\tau$  is the temporal dispersion of the medium.

8. (Original) The method as claimed in claim 7, in which the frequency interval  $\delta f$  is substantially equal to  $1/\tau$ , where  $\tau$  is the temporal dispersion of the medium.

9. (Previously Presented) The method as claimed in claim 1, in which the duration T is at least equal to  $N/\delta f$ .

10. (Previously Presented) The method as claimed in claim 1, in which the duration T is at least equal to  $N\tau$ , where  $\tau$  is the temporal dispersion of the medium.

11. (Previously Presented) The method as claimed in claim 1, in which the elementary signals exhibit random phases.

12. (Previously Presented) The method as claimed in claim 1, in which the waves are emitted with a certain passband, the frequencies  $f_{0i}$  comprise a minimum frequency  $f_0$  and the number n is determined so that the frequency band lying between  $f_0$  and  $f_0 + [(n+1)\cdot\delta f]$  substantially overlaps said passband.

13. (Currently Amended) The method as claimed in claim 1, in which the reception points are coincident with the emission points ( $T_1-T_N$ ).